REMARKS

The following remarks are submitted to be fully responsive to the Official Action dated June 13, 2003. It is further submitted that this Amendment is timely filed within the three-month shortened statutory period. Accordingly, no fee is deemed necessary for the filing of this Amendment. Should additional fees be required, the Commissioner is authorized to charge Kagan Binder Deposit Account No. 50-1775 and thereafter notify us of the same. Reconsideration of all outstanding grounds of the rejection and allowance of the subject application are believed in order and respectfully requested.

By this amendment, independent claims 27 and 29 are amended to emphasize certain features of the present invention believed allowable over the prior art of record. Support for this amendment can be found in the specification at page 3, lines 1-13. Specifically, independent claims 27 and 29 are amended to emphasize a rapid thermal response bypass conduit of the present invention as having the ability to bypass the heater corresponding to a workstation to rapidly cool the workstation below a predetermined value. Applicants respectfully submit that this is distinct from the prior art as set forth below.

Claims 27, 29, 30, 32, and 33 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,577,552 to Ebinuma et al. in view of JP 62-74112 or Moen or JP 4-371751 or JP 62-237248 or JP 61-27444. Applicants respectfully submit that these rejections are improper for at least the reasons set forth below.

The present invention is directed to apparatuses and methods for individually regulating the temperatures of each of a plurality of workstations. By the present invention each workstation of a plurality of workstations can be regulated at an individual predetermined desired temperature. The present invention also has the ability to rapidly cool a particular workstation in order to achieve a rapid temperature response. Thus, the present invention provides dual temperature control functionality in that each of a plurality of workstations can be regulated at a different temperature and any particular workstation can include a rapid cooling function.

The regulating and rapid cooling abilities of the present invention can be achieved by using information comprising the actual temperature of a particular workstation and the desired temperature of the workstation to control a temperature controlling fluid provided to the workstation. For example, a heater associated with a particular workstation can be

modulated to control the temperature of the temperature controlling fluid for maintaining the temperature of the workstation at some individual desired setpoint. Additionally, the heater can be bypassed so that an amount of the temperature controlling fluid is transported to the workstation for rapidly cooling the workstation to a predetermined temperature. Thus, the present invention provides the capability to rapidly change the temperature of a workstation and the capability to maintain a desired workstation temperature. This particular dual temperature control functionality is not taught or suggested by the prior art of record as described further below.

In particular, the Ebinuma reference is directed to an x-ray lithography system that is specifically designed to precisely hold plural components of the system at the same temperature. This is achieved by controlling small temperature fluctuations of a constant temperature liquid medium as explained below.

Referring to Fig. 1, the system of Ebinuma has three temperature components to be constantly held at the same controlled temperature. The system has a wafer stage, mask holder, and x-ray device. The mask holder positions a mask between a wafer positioned on the wafer stage and the x-ray device. In operation, x-rays are directed through the mask to the wafer such that a pattern or image of the mask is transferred to the wafer. This process requires precise constant dimensional alignment of these components, especially the mask and wafer. Thus, Ebinuma teaches how to keep the x-ray device, mask holder, and wafer stage constantly at the same temperature because any temperature variations are undesirable.

The system of Ebinuma teaches using a fluid to tightly control the temperature of the x-ray device, mask holder, and wafer stage to a constant temperature with constant precision. First, liquid is supplied at a temperature of 19.9 ± 0.01 °C, which is slightly below the desired temperature of 20.0 ± 0.01 °C. Making such a small temperature adjustment minimizes the possibility of erratic temperature variations that can be difficult to control. Next, the liquid is distributed to a heater that is associated with each of the components. Each of the heaters heats the liquid to 20.0 ± 0.01 °C. The reference further teaches that by using valves to control the pressure drop and by setting the heaters appropriately, the same temperature can be constantly maintained at each of the components. Thus, many steps are taken to minimize temperature variations.

Ebinuma goes on to teach that the x-ray device can introduce heat into the system. As such, it is considered to be an irregular and variable heat source. To control this variable heat source (to keep it at constant temperature that is the same as the other components), Ebinuma teaches using a temperature sensor and a controller to control the heater in response to the temperature sensor. The temperature sensor measures the temperature of the x-ray device and reports to the controller, which adjusts the heater accordingly. The purpose of including the temperature sensor and controller is to control temperature variations to maintain a constant temperature at the x-ray device. This temperature is specifically controlled to be the same temperature as the other components. There is no teaching in Ebinuma to provide rapid cooling of the x-ray device.

Ebinuma teaches one additional use of a temperature sensor and controller. Referring to Fig. 3, Ebinuma teaches using a temperature sensor at the distributor in conjunction with a control device at the main liquid supply device. This temperature sensor measures the temperature of the liquid at the distributor and reports to the controller, which adjusts the temperature of the liquid at the liquid supply device. Again, Ebinuma describes the importance of using valves to control the flow so that temperature variations are minimized and the same constant temperature can be maintained at the x-ray device, mask holder, and wafer stage.

The Official Action asserts that it would have been obvious to replicate the feedback controller shown at the x-ray device for any other station that had a variable and irregular heat load for improving temperature control. Applicants respectfully disagree with this assertion. Ebinuma is directed to a specific wafer processing system, that is, an x-ray lithography system. This system includes the specific components of an x-ray device, mask holder, and wafer stage, each having a specific function. This reference does not contemplate replacing these components with any other devices. Ebinuma refers to each of these components by a specific term throughout the specification and claims and provides these components for their specific functional purpose. The purpose of these components is to precisely position a mask relative to a wafer without distortion that can be caused by thermal effects. Thus, these components are thermally passive and do not introduce any heat into the system. There is no suggestion or any motivation for one to replace the mask holder and wafer stage with any functionally distinct components, such as a component having a

variable and irregular heat load. Any such component would be contrary to the function of the system of Ebinuma.

The only other use of a temperature sensor and controller contemplated by Ebinuma is at the distributor. There is no suggestion or motivation in Ebinuma to modify the system to have feedback loops for the mask holder and wafer stage. Ebinuma does not provide one of ordinary skill with the motivation to replace the mask holder and wafer stage with any other components. Thus, one would not add a feedback loop to the mask holder or wafer stage.

Applicants further submit that the combination of references as proposed by the Official Action is improper. The Official Action asserts that Moen or JP 62-74112 or JP 4-371751 or JP 62-237248 or JP 61-27444 each show some type of bypass that could be combined with Ebinuma to arrive at the presently claimed invention. Firstly, none of these references provide any motivation to make such a combination to arrive at the presently claimed invention. Secondly, any such combination would destroy the function of the teaching of Ebinuma.

Ebinuma teaches maintaining a constant temperature and minimizing temperature variations and does not teach or contemplate using a rapid temperature response bypass to cause a temperature change. Adding such a bypass to Ebinuma would provide temperature variations in the fluid, which are undesirable and contrary to the function of Ebinuma. The point of Ebinuma is to provide the liquid at a temperature very close to the set point with a tight temperature tolerance so as to minimize temperature variations in the fluid. An easily controlled, small amount of heat can then be added to the supplied fluid for the purpose of maintaining a constant temperature with minimal temperature variations. Again, Ebinuma provides no reason or suggestion to modify the system to add a bypass because it is contrary to the teachings of Ebinuma and would destroy its function.

Applicants therefore submit that the rejection of claims 27, 29, 30, 32, and 33 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,577,552 to Ebinuma et al. in view of U.S. Patent No. 4,386,650 to Moen or JP 62-74112 or JP 4-371751 or JP 62-237248 or JP 61-27444 is improper for at least the reasons discussed above. Applicants respectfully request withdrawal of the rejection.

In view of the above remarks, it is respectfully submitted that the claims and the present application are now in condition for allowance, which allowance is earnestly solicited. In the event that a phone conference between the Examiner and the Applicant's undersigned attorney would help resolve any remaining issues in the application, the Examiner is invited to contact the undersigned as set out below.

Respectfully Submitted,

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By: _____

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